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A POST-GRADUATE LECTURE
ON THE
TECHNIQUE OF INTRA-OCULAR
OPERATIONS.

BY

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THE TECHNIQUE OF INTRA- OCULAR OPERATIONS.

GENTLEMEN,—In the days of our forefathers ocular surgery belonged to the domain of general surgery, and it was not until about thirty years ago that the eye—a small and consequential organ then, as it still is now—was deemed large enough to engage the sole attention of the surgeon. Then it was that the first specialty in medicine was established, and the ophthalmic surgeon became a specialist. No wonder can be felt that this change took place. Up to a certain distance the paths of general and ocular surgery almost run parallel—that is to say, there is nothing very special in the treatment of many external ocular diseases. But beyond that point ophthalmic surgery reaches a metaphorical sign-post, the indication boards of which point in three divergent directions. First, to operations involving the interior of the eye. Secondly, to the estimation and treatment of errors of refraction. Thirdly, to the use of the ophthalmoscope. With respect to intra-ocular operations these are undoubtedly exacting upon the skill and capacity of

the surgeon : they demand such delicacy of manipulation, such attention to detail, such restraint of energy, that it is easy to understand how they should have passed out of the domain of general surgery. Contrast, for example, the delicacy and precision required for the section in a cataract extraction with the ease and comparative indifference with which an incision is made through the skin in general surgery. Remember, too, the control of physical force which is requisite in the operations upon the eye. I am often inclined to wonder, after bringing off a long carry with my cleek at golf, what becomes of the muscular force thus called into action when I am doing a section for cataract. This physical restraint, and the necessary delicacy of manipulation demanded of the surgeon are two factors which doubtless have had not a little to do with the creation of ocular surgery into a specialty. Then with regard to the estimation and treatment of errors of refraction. This is a subject which proverbially is distasteful to medical students. They never display the least interest in it. They cannot see that it is interesting, and for this reason they avoid it as much as possible. Whereas if they could only come to realise how useful an adjunct it can be made to their general work in after life, there is no doubt that many would take the trouble to learn its main features, and cultivate the details of its practice. Lastly, with reference to the ophthalmoscope. The special training that this requires, in which

demands are made upon the patience and painstaking of the student, at once places it beyond the reach of those who otherwise might devote much of their time to ophthalmic work. Here again muscular restraint is demanded, for the practice of the ophthalmoscope requires complete relaxation of the ciliary muscle on the part of the observer. This is a very easy matter to the practised ophthalmologist, but only because he is continually using the ophthalmoscope.

After this brief digression let me now point out to your attention that there are various general considerations to which reference must be made in discussing the subject of intra-ocular operations, and of these the first upon which I shall lay the most stress belongs to the strict observance of aseptic principles in the treatment of all ocular wounds.

In reflecting upon the fact that it is impossible to sterilise the conjunctival sac, let us contrast the local conditions in this regard under which the ophthalmic surgeon has to operate with the efforts to sterilise the seat of operation practised by the general surgeon. And in doing so let us imagine what a general surgeon would probably regard as necessary in order to render an eye operation sufficiently sterilised from his standpoint. First, inasmuch as hairs are often the seat of subtle infection doubtless all the eyelashes would have to be cut off or removed. Next seeing that infective pus-organisms frequently gain entrance to the

conjunctival sac by means of the canaliculi, it would probably be deemed necessary to excise the lacrymal sac. Then attention would be turned to the conjunctival sac, but what would be considered necessary here, seeing that the sac is always teeming with micro-organisms, imagination fails to suggest. Nevertheless there would be sound method in all these elaborate precautions, despite, perhaps, their apparent transcendentalism. For when we come to consider how impossible sterilisation is for operations upon the eye, wonder can only be felt at the freedom from infective processes with which they are now generally associated. The explanation undoubtedly is that of the complexity of micro-organisms which find the conjunctival sac so favourable a medium for their cultivation, only a few are really pathogenic. The majority of them are harmless bacteria, and are non-infective. Despite, therefore, the apparently desperate conditions of non-sterilisation under which the ophthalmic surgeon is called upon to operate, repeated experience enables him to dispel the fear of septic infection of his operation wounds. And by what means has this confidence in his results been attained? By a detailed, systematic, and rigid adherence to the principles of asepticism, so far as they can be applied to operations upon the eye.

Let me now describe the method of procedure which I am accustomed to adopt in this regard.

The Preparation of the Patient.

On the evening preceding the day of operation, no matter what the nature of the intra-ocular operation may be, the patient's face is thoroughly washed with hot water and soap ; the conjunctival sac of the eye to be operated on is next thoroughly douched with a 1-4000 chinosol solution ; afterwards a large pad of chinosol gauze is placed over the eye, and fixed with a bandage. This is allowed to remain in position until the time comes for the instillation of the cocaine solution. A few words as to the strength and method of use of the latter. It should be freshly prepared and of the strength of 4 per cent. This is amply strong enough for all purposes. Several drops of the solution are instilled into the conjunctival sac of each eye, by the nurse, every five minutes in the course of half an hour before the time fixed for the operation. By placing both eyes under the influence of local anæsthesia the tendency to movement in the fellow eye is subdued.

There is next the question of general anæsthesia in cases of intra-ocular operations. Under what circumstances is this necessary? Generally speaking, chloroform should be administered to the patient who manifests any uncontrollable restlessness arising either from ignorance or excessive nervousness. For example, this was necessary the other day in the case of the blind old Irishwoman, for whom some of you saw me extract the right

lens for senile cataract. She positively declined to submit to the operation unless chloroform was given. Despite, however, the occurrence of vomiting and retching, and a profuse display of lacrymal emotion immediately after the extraction, the eye has rapidly recovered without a bad symptom with a perfectly black pupil. Again, in all cases of glaucoma a general anæsthetic is indicated. The increased intra-ocular tension present prevents the due absorption of the cocaine solution, and thus the local anæsthesia is rendered incomplete. In all cases in which a general anæsthetic is used in intra-ocular operations deep anæsthesia is absolutely requisite. Unless this be induced the greatest risk is run of the patient suddenly squeezing the eye, rupturing the delicate hyaloid membrane and causing a large escape of the vitreous. For expediency's sake as well as for the comfort of the surgeon and the well-being of the patient the administration of the anæsthetic should always be placed in the hands of an expert anæsthetist. Everything then being in readiness for the operation the next step is to place the lid speculum in position and thoroughly douche the conjunctival sac with a warm 1-4000 chinosol solution. This small, though important, detail practically ensures the mechanical removal of any infective matter which, despite every precaution, may have been conveyed to the conjunctival sac by means of the cocaine solution. History records that in the early days of operating with cocaine anæsthesia

many cases of suppuration of the wound occurred. This constituted at first a most difficult problem to solve. Ultimately it was shown that the source of the infection was the cocaine solution, and the untoward results at once ceased as soon as freshly prepared solutions were employed. Bearing in mind the evil which infective solutions may cause I always allow the operation wound to heal, which usually occurs in forty-eight hours, before instilling any drops which the case may happen to indicate as advisable. After each step in the operation a gentle stream of warm chinosol solution is poured over the wound from an undine. This not only removes any blood that may be present, but also ensures the mechanical cleanliness of the seat of operation.

The Care and Sterilisation of the Instruments.

My instruments are never boiled. Eye instruments are too delicate to be submitted to the coarse process of sterilisation by boiling. For many years, therefore, I have been accustomed to sterilise my instruments by placing them for ten minutes in pure carbolic, previously to using them. By this means they are never tarnished, they always look bright and clean, and their complete sterilisation leaves no room for doubt, inasmuch as the micro-organism would have to be one of a most robust nature which could survive ten minutes' submersion in pure carbolic acid. I am indebted

to my friend and former colleague, Mr. Lenthal Cheatle, for the assurance that this method of sterilisation is quite trustworthy. Another small detail: I allow no one to touch the instruments but myself. This is useful and expedient, for, again, eye instruments are too delicate to permit of rough handling. I was reminded of this one day by seeing a nurse scrubbing her hardest in order to dry my iris forceps with a piece of lint. I never operate with hospital instruments. Both my private and hospital operations are done with my own "tools." Thus I have come to know my instruments, and I suppose by this time that they have come to know me. There is one exception to the preparation of the instruments above described, and that is in respect to the Graefe's knife. The keenness of the cutting edge would be destroyed were the blade to be immersed in the pure carbolic; consequently a small piece of gauze is dipped in the carbolic and passed several times over each surface of the blade, which is sufficient to ensure its sterilisation. Two antiseptic solutions are always prepared for use at the operation: One that of 1-4000 of chinol for the hands and douching the wound; the other, 1-20 of carbolic for the instruments. Immediately after the latter have been removed from the pure carbolic they are placed in the carbolic solution, in which they are thoroughly washed in order to remove all the surplus pure carbolic which may be adhering to their surfaces. Obviously this procedure is one

which must never be overlooked. The chinosol solution is inadvisable for steel instruments, inasmuch as some oxidation process takes place, causing staining, when it comes in contact with the metal. As a last detail, before the operation is begun a warm carbolised towel is wrapped round the patient's head, so preventing the surgeon's fingers from coming in contact with the hair, which otherwise would expose them to the risk of contamination.

The Dressings and After-Treatment.

One of the most satisfactory features of the application of modern surgical principles to eye surgery is the simplicity which now characterises the after-treatment of intra-ocular operations. This fact is one which is still unknown to the uninstructed or popular world. The traditional dread of, say, a cataract operation, which still largely prevails, is nevertheless unfortunately based upon a firm foundation. In earlier days a cataract extraction must have been a horrible proceeding, both from the patient's as well as the surgeon's point of view. First, on account of the intense suffering to which the patient was compelled to submit; secondly, by reason of the elaborate and generally futile treatment which the surgeon deemed necessary to adopt in the endeavour to gain a good result. About half a century ago a cataract was extracted without an anæsthetic; then,

as a preliminary step to the operation, the hapless patient was bled. The object of the latter method was to lessen the severity of those inflammatory symptoms which, as we may now conclude, were in the majority of instances of septic origin. Writing in 1843, Mackenzie says, "It rarely happens but that this operation (cataract) is followed by such a degree of inflammation in one or other of the textures of the eye as to require the abstraction of blood from the system. So well established is this observation that some make it a general rule to bleed the patient at the arm in the course of the first twenty-four hours after the operation, whether pain is complained of or not." Thus at this time a cataract operation involved acute suffering in the course of the extraction, acute pain afterwards, as the result of the intense inflammation, confinement to bed and a dark room for many days, repeated systemic venesection, mercury always pushed to salivation, and an "antiphlogistic" diet, which meant, among other details, no solid food for a fortnight, with, in the end, an eye which was frequently useless for any visual purpose. Surely the worst torments of the Inquisition would have had difficulty in surpassing such an ordeal as this. With such a record of the past, is it surprising that a traditional fear still exists against submitting to an operation for cataract? Another generation at least will have to pass away before the evil reputation of this operative procedure has ceased to excite misgivings. Nevertheless in this connection

it is interesting to note that now it is usual for patients, in whom double cataract is present, to ask for the second eye to be operated upon after a successful operation has been performed upon one. It is scarcely possible to believe that in earlier days human fortitude would have been equal to any such request as this.

In the after-treatment of his cataract cases, in the present day, speaking generally, the aim of the surgeon should be to interfere as little as possible with the ordinary routine of the patient's life. Confinement to bed, of course, is necessary at first : nevertheless this should be entirely unaccompanied by any measure of restraint, such as that of tying the patient's hands to the bed. According to some this procedure should always be adopted, in order to prevent the patient from unconsciously disturbing the dressings and causing injury to the eye, while asleep. But in my opinion the better plan for avoiding this contingency is to have a nurse sitting at the patient's bedside for the two succeeding nights following the operation. By this means any tendency to harmful movements of the hands which might arise can be easily and securely checked, with the least discomfort to the patient.

The mode of dressing which obtains in my cases is as follows : After the removal of the speculum the patient is told to close the eye ; the eyelashes are then gently smeared with ung. iodoformi (gr. iv, ad ʒj). This serves two purposes : first, in helping to maintain the sterilisation of the ciliæ ;

secondly, to prevent the lids from subsequently adhering, and so obstructing the free escape of the tears into the dressings from the conjunctival sac. This may appear a small, perhaps unnecessary detail; on the other hand it is really one of no little importance so far as the comfort of the patient is concerned. Unless a free escape is provided for the tears the conjunctival sac soon becomes so distended that pain and irritation are caused. Over the closed lids is then placed a pad of dry chinosol gauze : this is covered with a thin layer of absorbent wool, and a few turns of a bandage, lightly applied, keep the dressing in position. I never consider it necessary to cover the fellow eye.

Is it expedient to exclude any light from the room in which the after-treatment will be carried on? The answer to this must be emphatically in the negative; neither is a dark, nor a darkened room a necessary adjunct to the after-treatment of intra-ocular operations in the present day. My practice always is to allow the room to be as light as daylight can make it, with this single proviso, that the patient while lying in bed is not actually facing the light. Next as to diet. What directions are indicated in this regard? Bearing in mind the muscular movements of the face which accompany the mastication of solid food, it is wise to avoid these by confining the patient to a liquid diet for the first forty-eight hours after the operation. By this time the wound has generally healed, and then solid food may be resumed with-

out risk. How long should the patient be confined to bed? No fixed rule can be formulated in this regard. The conditions will vary in each case, so far as the patient, the nature of the operation, and the after-progress are concerned. Speaking generally, however, the patient may be allowed to get up for the first time on the evening of the third day after the operation.

The After-Dressings.

The dressings after every intra-ocular operation should be changed once in every twenty-four hours. The necessity for this is obvious in view of the fact that the operation has not been performed under conditions of absolute sterilisation. Moreover it is comforting to the patient to have the dressings changed, as well as to have the opportunity of being reassured by the surgeon as to the progress of the case. The ordinary procedure of the after-dressing is perfectly simple. After removal of the bandage and the gauze pad, the lashes, lids, and canthi are washed with a swab dipped in a 1-4000 warm chinosol solution, the patient is then told to raise the upper lid, and some of the solution is allowed to flow into the conjunctival sac. Afterwards the lids are again closed, the iodoform ointment applied, and the dressings renewed. This procedure is followed for about ten days, when a shade without any dressings is substituted.

In the foregoing, I have endeavoured to lay

before you, as minutely as can be, the technique which obtains in my cases of intra-ocular operations. The details may appear in some instances to be of a trifling nature. But as a matter of fact nothing in detail is too trifling to adopt in the practice of ophthalmic surgery. Indeed, the successful practice of this branch of our profession may be said to be made up of a bundle of important little details, just as Oliver Wendell Holmes described life to be made up of a bundle of little sticks.